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ABSTRACT

In this brief guide, the use of microcomputer spreadsheet programs is discussed. Key characteristics are described, with examples of what these programs can do: calculations, recalculation, table lookup, data storage, logical decisions, and simple graphics. Advanced spreadsheet features are noted--consolidation, sort, and execute. Finally, selecting the right software is discussed. References are included. (MNS)

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EVALUATION GUIDES

Guide Number 9

MICROCOMPUTERS: SPREADSHEET SOFTWARE

Peter J. Gray

The use of microcomputer-based spreadsheet programs is discussed, including:

- Key Characteristics of Spreadsheet Software
- Examples of What They Can Do
- Advanced Spreadsheet Features
- Selection of the Right Software
- References

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KEY CHARACTERISTICS OF SPREADSHEET SOFTWARE

Some say that the electronic spreadsheet in the form of the first VisiCalc program is what started the microcomputer revolution, and particularly the Apple computer. With this very basic tool, a microcomputer can be used to do anything that it is possible to do by hand using a multi-column ledger page. For example, spreadsheet programs can be used to:

prepare a budget, make an income tax projection, calculate cash flow, do cost analyses, determine overhead allocations, generate sensitivity analyses, calculate weighted averages, prepare statistical summaries, analyze survey results, prepare bid specifications, keep track of study participants, and more.

In a few short years spreadsheets have grown from not much more than electronic ledgers to programs that include present value function, linear programming, and calculus functions. They also are likely to be able to read data from files created by other programs, such as accounting applications or data bases.

Integrated programs are often build around a sophisticated spreadsheet. One form of integration is the program that includes spreadsheet, graphics, and word processing programs all in one super program. Examples of this type of program are MBA (Context Management System; Torrance, CA), and 1-2-3 (Lotus Development; Cambridge, MA). Companies like VisiCorp provide compatibility among the different programs in their line, such as VisiCalc, VisiFile, and VisiPlot so that data can be shared among these separate programs. A new development is the integration of spreadsheet and data base management programs such as LogiCalc (Software Products Int'l; San Diego, CA). In trying to decide among different approaches to integration, one must consider both the quality of the individual programs and the ease with which data can be transfered.

EXAMPLES OF WHAT THEY CAN DO

The examples on the next several pages illustrate what the VisiCalc program can do.

Calculations

Like a calculator, VisiCalc excels at performing calculations (adding, subtracting, multiplying, dividing). In the example below, someone enters the number of students participating in a Chapter I program in the shaded area. The VisiCalc worksheet totals the number of students at each grade and in each subject area.

NUMBER OF CHAPTER I STUDENTS

Grade	Read	Math	Total
2	–	–	0
3	–	–	0
4	–	–	0
Total	0	0	0

BEFORE

NUMBER OF CHAPTER I STUDENTS

Grade	Read	Math	Total
2	23	14	37
3	35	27	62
4	25	23	48
Total	83	64	147

AFTER

Recalculation

Unlike a calculator, VisiCalc can easily recalculate the results when any value is changed. In the example below, we reduce the FTE for Denison to try to reduce the project total to a more reasonable figure. VisiCalc immediately recalculates the totals using the new value for FTE.

PROJECT STAFF BUDGET

Staff	FTE	Salary	Benefit	Total
Jones	.5	9450	1890	5670
Denison	1.0	12725	2545	15270
Williams	.5	9450	1890	5670
Clark	1.0	13900	2780	16680
Faddis	1.0	12725	2545	15270
Total Salaries and Benefits				58560

BEFORE

PROJECT STAFF BUDGET

Staff	FTE	Salary	Benefit	Total
Jones	.5	9450	1890	5670
Denison	.5	12725	2545	7735
Williams	.5	9450	1890	5670
Clark	1.0	13900	2780	16680
Faddis	1.0	12725	2545	15270
Total Salaries and Benefits				51025

AFTER

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Table Lookup

Often we have to look up values in a table (e.g., test score, salaries, bonus points) before doing a computation. VisiCalc can do the table lookup for us. In the example, we enter a code and the worksheet looks up the proper points and computes the total.

Activity	Bonus code	Bonus points
Books read	1	10
Participation	2	20
Extra report	3	40

Student	Test	Hawk	Bonus code	Total
Janice A	53	24	1	87
Dennis B	69	15	2	104
James B	24	20		44
.				
.				

Data Storage

Information can be stored on floppy disks for later use. In the example below, program expenditures are added to a VisiCalc template each month. The computer recomputes the Year-To-Date Expenditures and Percent of Budget expended.

PROGRAM EXPENDITURES COMPARED TO BUDGET

Act #	Account	Budget	YTD Expend	% of Budget	SEP	OCT	DEC	JAN
100	Salaries	56000	14000	25	4670	4670	4670	
200	Benefits	14500	3625	25	1208	1208	1208	
300	Pch serv	1200	800	67	280	520		
400	Supplies	1800	2100	117	1700	400		
500	Outlay		0	0				
600	Other		0	0				

Logical Decisions

Often we want to do a computation only if some condition is true. For example, we will consider students eligible for a special program only if their test score or grade point is above or below some criterion. The worksheet below marks a student as eligible for Chapter 1 services only if the test score is below the cutoff.

Chapter I Student Selection Worksheet

Cutoff on test: Reading 35
Math 39

Student	Read Score	Math Score	Reading Eligible	Math Eligible
Janice A	22	52	*	
Dennis B	45	29		*
James B	15	5	*	*
.				
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Simple Graphics

Do you ever tire of reading tables of numbers? VisiCalc can help by constructing simple bar graphs. Here we enter numbers in a graphing worksheet which rescales and displays the results.

MIGRANT STUDENT ENROLLMENT BY MONTH

Month	Enrollment	
Sept	17	*********
Oct	23	*************
Nov	11	******
Dec	3	**
Jan	4	**
Feb	4	**
Mar	10	*****
Apr	31	*****************
May	36	********************

ADVANCED SPREADSHEET FEATURES

Recent spreadsheet programs provide extended features that are not available with the original VisiCalc. The table below suggests some features to look for in the new generation of spreadsheet programs such as Multiplan, SuperCalc2, and Advanced VisiCalc.

Feature	Description
Consolidation	Allows worksheets to be linked together (e.g., Years Summary worksheet accesses totals from 12 Months Summary worksheets). Makes the spreadsheet seem three-dimensional.
Sort	Allows the rows or columns to be sorted in numeric or alphabetic order (e.g., reorder list of students from lowest test score to highest for selection purposes).
Execute	Executes a series of commands from a command file that you have created (e.g., load a worksheet, print the results, change a value, print the new results).

SELECTING THE RIGHT SOFTWARE

In one sense, hardware requirements are the first characteristic of a program that should be considered and, in another sense, they are the last. From a realistic point of view, the first criteria for selecting a program is whether it will run on a machine you already have, or on a machine that you feel you can afford to buy for statistical and other purposes.

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However, within these general constraints, hardware becomes a secondary consideration, because there is a variety of good programs to choose from for most of the popular and widely used machines with operating systems such as Apple DOS 3.3, IBM-PC DOS or MS-DOS, and CP/M. Within each group, programs vary in terms of their sophistication and cost and in terms of the specific hardware system characteristics that they require.

In summary, if a commitment has already been made to purchase a particular machine, or if there are special budget limitations, hardware-related requirements are the first features of a program that should be considered. However, if there are no rigid constraints, it is best to ignore these requirements for the time being and move on to the other more substantive features of data management programs.

It is important to evaluate a program in terms of its versatility regarding those features you need most. Selection may come down to the program(s) with the best ratings on those features of greatest importance as opposed to those with the best over-all ratings. This notion of the highest ratings on the most important features is worth considering. Sometimes pricing, especially in regard to multiple copies, is the deciding factor among programs of generally equal ratings. In other cases it may be that speed, error handling, and versatility (i.e., program performance) is more important than either ease of use or support. Therefore, lower ratings in these areas would not disqualify a program if it was a strong performer.

Using the information provided in this guide will help you to judge the quality of the individual programs. The procedures also provide a way to compare programs in a consistent manner.

Any combination of features is possible. Selection should be based, therefore, on a consideration of the combination of features most desired for the types of tasks to be performed using the program.

In order to make a sound choice:

1. Describe your use(s) - what will you use the program for?
2. Identify the features you need - what do you want to be able to do?
3. Plan ahead for new needs - what are you likely to want a year from now?
4. Consider constraints - What price range, hardware (e.g., machine type, printer features) and user preferences are you limited by?

5. Put features into a rough priority list - which are the most, somewhat, and least important features?
6. Try out and compare products - who has the features you need and want within your constraints?
7. Remember support - will there be someone you can talk to if there are problems after you buy the program?

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